EIT Recommendation

Fish tissue "AWQC- like" criteria and water quality PRG's based on 1E-5 target risk will be specified in the D2 ROD for all 22 radionuclides. In the D2 EMDF ROD, compliance will be based on instream water column PRG's for 16 radionuclides; the remaining 6 radionuclides (C-14, Co-60, Cs-137, Eu-154, Pu-238, and Pu-239) will be "monitor and report only" for instream water column PRGs but compliance will be based on the fish tissue criteria. All contaminated landfill wastewater will go through primary treatment consisting of flocculation and chemical precipitation process.

To implement this approach:

1. Sampling of landfill wastewater effluent from the discharge pipe will be performed to demonstrate, at a minimum, compliance with current DOE rad discharge limits for all 22 radionuclides.
2. Sampling of instream water at the point of discharge will be performed to demonstrate compliance with 16 water column PRG's; compliance for the remaining 6 radionuclides will be addressed via "monitor and report only" for instream water column PRG's and compliance with the fish tissue criteria for those 6 radionuclides.
3. Routine fish tissue sampling will be conducted in Bear Creek to demonstrate compliance with all 22 fish tissue criteria.
4. If the trigger level (to be defined in post-ROD documentation) below a 1E-5 risk level fish tissue criteria is exceeded for the 6 radionuclides, then an evaluation will be done to determine what actions are needed to prevent exceedance of the fish tissue criteria. The specific monitoring plan will be part of the Remedial Action Work Plan.

Additional Details:

1. The Remedial Design document will determine point of discharge.
2. A target risk of 1E-5 will be used in establishing both fish tissue criteria and instream water column PRG's
3. EPA default bioaccumulation factors will be used in establishing instream water column PRG's
4. A site-specific fish consumption assumption of 15, 8-oz fish meals/year for 26 years will be used in PRG's

Radionuclide	AWQC-like Instream Water Column PRG (pCi/L)	Fish Tissue criteria (pCi/gm of fish)	Current Radiological Discharge Limits (pCi/L)
Cl-36	5.41E+02	2.54E+01	8.00E+03
Tc-99	1.88E+03	2.82E+01	1.10E+04
I-129	1.13E+01	3.39E-01	8.25E+01
Pb-210	1.31E+00	3.28E-02	9.75E+00
Np-237	4.14E+01	1.24E+00	8.00E+01
Am-241	3.51E+00	8.42E-01	4.25E+01
Th-228	4.34E+01	2.60E-01	8.50E+01
Th-230	1.58E+02	9.49E-01	4.00E+01
Th-232	1.42E+02	8.49E-01	3.50E+01
H-3	8.71E+05	7.84E+02	2.15E+05
Sr-90	3.85E+02	1.12E+00	2.75E+02

Ra-226	5.49E+01	2.20E-01	2.18E+01
Ra-228	1.99E+01	7.95E-02	6.25E+00
U-233/U-234	1.21E+03	1.17E+00	1.65E+02
U-235/U-236	1.20E+03	1.16E+00	1.80E+02
U-238	9.72E+02	9.34E-01	1.88E+02
C-14	1.41E-01*	5.65E+01	1.55E+04
Co-60	6.66E+01*	5.06E+00	1.80E+03
Cs-137	1.20E+00*	3.00E+00	7.50E+02
Eu-154	6.11E+01*	7.95E+00	3.75E+03
Pu-238	3.17E-02*	6.66E-01	3.75E+01
Pu-239	3.08E-02*	6.47E-01	3.50E+01

* - Calculated instream water column PRGs for radionuclides that are “monitor and report only”; compliance for these radionuclides will be demonstrated via fish tissue criteria. The use of default bioconcentration factors (BCFs) for these 6 radionuclides results in highly conservative instream water column PRGs that are near or below analytical detection levels. Stream protectiveness will be maintained by setting a trigger level below the 1E-5 risk level for fish tissue that will be assessed via direct measurement of fish tissue. This approach provides a direct indication of possible radionuclide bioaccumulation in fish tissue without relying on highly conservative, default modeling parameters (i.e., BCFs). And routine monitoring of the instream water concentration for these 6 radionuclides provides a further protective measure to ensure fish tissue criteria are not exceeded.